

# Capital partnerships: Planning for long-term success

With significant capital investment in equipment and extensive associated facility modifications, Almac successfully transferred and scaled-up Ironwood Pharmaceuticals' innovative yet challenging orally delivered peptide product, linaclotide, helping them prepare to meet global demand in multiple territories.





## Client partnership

The client partnership began in 2011 as a pharmaceutical development project in phase III utilising Almac's existing pilot scale technology. Planning for commercial product approval, both partners recognised the product knowledge base built within Almac and agreed upon a strategic investment to facilitate scale-up and technology transfer into ongoing commercial supply.

The capital investment allowed Ironwood to scale up for the first commercial product launch, servicing late phase development into commercialisation from the same manufacture site and project team. Utilising Almac's technical, engineering and project management expertise to deliver a custom solution to an aggressive project timeline assisted this valued client in securing supply for this important product.

## Challenges

Ironwood sought a Contract Manufacturing Organisation (CMO) for its novel linaclotide drug product, requiring the CMO to transfer, scale-up manufacture and package its product to meet an aggressive regulatory timeline. It was imperative to Ironwood that the CMO had a proven track record of delivering high value investment projects at site, on time and within specification. The project presented both technical and logistical challenges:

1. The active pharmaceutical ingredient is administered at an extremely low dose.
2. Clinical and commercial supplies were met by manufacturing at Almac's pilot facility at a representative scale of 50kgs, saving significantly on API allocation. However, Ironwood's ongoing commercial needs for its territories exceeded the capacity of Almac's available equipment, requiring Almac to qualify an entirely new equipment train.
3. URS, equipment manufacture, facility modifications, installation and qualification of the equipment train was required within a 15 month timeline.

## Almac solution

### Technical hurdles

Almac began this technical effort by assembling a joint Ironwood-Almac multidisciplinary transfer team composed of development and commercialisation experts. The team arranged extensive trials to identify optimal equipment parameters and to design a suitable environmental management and control program. Process-control problems that might have occurred were thereby anticipated and pre-empted. Furthermore, a rigorous process understanding exercise meant all critical sources of potential variability had been identified and explained through group meetings, process maps and document reviews.

The same transfer team also coordinated design, installation and qualification of three separate GMP suites at Almac: one designated for dispensing, another for fluid bed processing and a third for encapsulation.

From the outset Almac identified the importance of scientific continuity; therefore, the same project team assigned to manage product supply at 50kg scale were tasked with introducing and implementing the new equipment train. For Almac and Ironwood, having development, launch and ongoing commercial resources (personnel and facilities) all available from one site ensured that product specific knowledge gained over several years was not lost or diminished. From its very first engineering batches, Almac applied its accumulated knowledge and successfully produced consistent product at a high yield, an achievement it has continued with every batch it has manufactured to date.

### Logistical hurdles

Almac's accelerated equipment installation called for expansion of existing GMP space by over 1,500 sq. ft. in a well-utilised facility without disturbing existing commercial operations. Almac's engineers coordinated with multiple equipment manufacturers for an installation effort that included lifting the roof to install the large scale fluid bed unit. With this completed, Almac's new commercial suites incorporated:

- Laminar flow booths with humidity control
- Glatt GPCG PRO 120 fluid bed unit with a working capacity of up to 250kg
- IMA Adapta 100 encapsulation machine with throughput capacity of up to 100,000 capsules per hour and an integrated online checkweigher



### Common thread: Almac's project management

Almac's project management was essential in overcoming the challenges presented by this innovative drug product. Support from senior management sponsors allowed for more flexible decision-making and led to faster outcomes. From the outset, Almac created a communication matrix that defined key roles, responsibilities and contact details for each team member. In addition, Almac issued a comprehensive project plan specifying key deliverables and timelines. The project plan drove weekly conference calls between the two sites. Almac emphasised face-to-face meetings despite the transatlantic flight. These regular meetings promoted a team ethic that encouraged freely sharing knowledge, experiences and ideas for the best paths forward.

Almac dedicated an experienced Project Manager to oversee the multidisciplinary activities. The Project Manager focused on a precise set of requirements, decision points, milestones and best practices that ensured a timely and well documented transfer within budget. Project teams closely examined plant capabilities and capacities, operator training levels and regulatory and safety concerns, all with a view to identifying gaps and implementing corrective actions. Our technology transfer programmes included the following to help ensure success:

- Centralised decision-making structure
- Supply chain management
- Communication and documentation systems
- Gap analysis and risk management
- Quality assurance and regulatory alignment

## Results

In less than thirteen months, and within the projected budget, Almac overcame logistical and technical hurdles to procure, install and qualify a commercial equipment train that could meet the demand of a global market supply of a low-dose novel peptide pharmaceutical product.

The investment and installation of the new commercial suites demonstrates Almac's commitment to building long term, strategic relationships with our client partners, allowing Almac to service a key client's ongoing commercial needs whilst retaining the flexibility and excess capacity to attract new clients seeking commercial scale fluid bed processing and/or high speed encapsulation technologies.



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## Get in touch

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